

# MONTANA STATE LIBRARY



CONSERVATION STATUS OF ERIOGONUM X LAGOPUS

IN SOUTHERN CARBON COUNTY, MONTANA

Prepared by:

Peter Lesica & Peter L. Achuff  
Montana Natural Heritage Program  
State Library Building  
1515 East Sixth Avenue  
Helena, Montana 59620

Prepared for:

USDI Bureau of Land Management  
Montana State Office  
P.O. Box 36800  
Billings, Montana 59107-6800

STATE DOCUMENTS COLLECTION

FEB 18 1993

January 1992

MONTANA STATE LIBRARY  
1515 E. 6th AVE.  
HELENA, MONTANA 59620

PLEASE RETURN



## Table of Contents

I.	SPECIES INFORMATION	1
A.	Classification	1
B.	Present Legal or Formal Status	2
C.	Description	3
D.	Geographical Distribution	3
E.	Habitat	4
F.	Population Demography and Biology	7
G.	Ecology	8
H.	Land Ownership	9
II.	ASSESSMENT AND MANAGEMENT RECOMMENDATIONS	9
A.	Threats to Known Populations	9
B.	Management Practices and Response	10
C.	Recommendations for Maintaining Viable Populations	11
D.	Summary	11
III.	LITERATURE CITED	12
IV.	APPENDIX: Communications from Robert Dorn and James Reveal	14
V.	PHOTOGRAPH	19

## I. SPECIES INFORMATION

### A. CLASSIFICATION

1. **SCIENTIFIC NAME:** Eriogonum X lagopus Rydberg (Rydberg 1917)
2. **SYNONYMS:** Eriogonum multiceps Nees ssp. canum Stokes (Stokes 1936), E. pauciflorum Pursh var. canum (Stokes) Reveal (Reveal 1967), E. brevicaule Nutt. var. canum (Stokes) Dorn (Dorn 1988)
3. **COMMON NAME:** Rabbit buckwheat
4. **FAMILY:** Polygonaceae (Buckwheat Family)
5. **GENUS:** Eriogonum has approximately 150 species, all but one of which are found in North America (Hitchcock et al. 1964). Annual members are relatively distinct based on minute characters, while perennial species are connected through series of intermediates and are often difficult to distinguish (Welsh et al. 1987).
6. **SPECIES:** The plant that we are calling Eriogonum lagopus has a confusing taxonomic history. It was first described by Per Axel Rydberg (1917) in his Rocky Mountain Flora from specimens collected in Wyoming (Rydberg 1917). In 1936, Susan Stokes published Eriogonum multiceps ssp. canum based on material from Yellowstone County collected by Blankenship in 1890 (Stokes 1936). In 1967, James Reveal decided that the Blankenship collection was better treated as Eriogonum pauciflorum var. canum and he also included a Tweedy specimen from Park County, Montana in this taxon (Reveal 1967). Sometime later, Reveal decided that both the Blankenship and Tweedy collections were the same as the type specimen for E. lagopus. Consequently, he placed both E. multiceps ssp. canum and E. pauciflorum var. canum in synonymy under E. lagopus since the latter was the first described taxon at the species level. In 1977, Robert Dorn placed E. lagopus and E. pauciflorum var. canum in synonymy under Eriogonum brevicaule (Dorn 1977). Finally, in 1988, Dorn published the new combination E. brevicaule var. canum and placed both E. multiceps ssp. canum and E. pauciflorum var. canum in synonymy under it (Dorn 1988; personal communication, Appendix A).

Reveal reports that Eriogonum lagopus is a hybrid complex involving E. brevicaule and E. pauciflorum (J. Reveal, personal

communication; Appendix A). He believes that the taxon is worthy of recognition at the species level. Welsh et al. (1987) recognize the commonness of hybridization in the E. brevicaule complex and treat such hybrids as varieties of E. brevicaule. Robert Dorn does not believe that this taxon is a hybrid and feels that it is better treated as a variety of E. brevicaule. We collected specimens that appear to be intermediate between E. lagopus and E. mancum or E. pauciflorum.

An additional difficulty in the taxonomy of this taxon arises because most specimens of E. lagopus collected from Carbon County have hair on the perianth, while Rydberg's (1917) description of E. lagopus states that it has a glabrous perianth.

In this report, we will continue to call this taxon Eriogonum lagopus, although this may well not be the correct name.

## B. PRESENT LEGAL OR FORMAL STATUS

### I. FEDERAL STATUS

- a. **U.S. Fish and Wildlife Service:** C-2; E. lagopus is a candidate for listing as a threatened or endangered species, but currently there is not enough information to make a decision on listing (USDI-FWS 1990).
- b. **U.S. Bureau of Land Management:** The Interim Draft Policy Regarding Sensitive Plants and Sensitive Plant Communities on BLM Lands in Montana lists E. lagopus as Special Status, Priority 1 in Montana. BLM will take no conscious action that will cause a species of special status to be listed as threatened or endangered. Priority 1 species may, after proper evaluation, be considered for Areas of Critical Environmental Concern (ACEC) or Research Natural Area (RNA).

2. **STATE STATUS:** Eriogonum lagopus is currently listed by the Montana Natural Heritage Program as globally rare and/or local (G3) and rare or local in Montana (S3). It is listed as a species of limited distribution in Montana by Lesica and Shelly (1991). These state listings do not provide any direct legal protection for E. lagopus.



## C. DESCRIPTION

1. **GENERAL NONTECHNICAL DESCRIPTION:** Eriogonum lagopus is a perennial herb with a taproot and woody branched rooterown. The clusters of basal leaves form small mats on the surface of the ground. The leaves are lance-shaped to narrowly spoon-shaped tapering to a petiole ca. 1 inch long. The leaves are densely white-hairy beneath, less so above; they are 1/2 to 2 inches long and less than 1/4 inch wide. The leafless erect stems are 2-5 inches tall and loosely covered with long, white hairs. The umbrella-like inflorescence is 2-3 times branched. Each ultimate branch ends in a small cup-like involucre, ca. 1/6 inch long, with numerous flowers arising from inside. Each flower has 6 yellow petal-like tepals, less than 1/20 inch long with sparse long hairs on the outside. The anthers and anther stalks are yellow.
2. **TECHNICAL DESCRIPTION:** Perennial herb with a woody taproot and branching woody crown often forming small mats; leaves all or mainly basal; blades oblanceolate to narrowly spatulate often with revolute margins, 1-6 cm long and 2-8 mm wide, densely white tomentose beneath, sparsely tomentose to glabrate above, tapering gradually to a petiole 1-2 cm long; stems erect, 3-10 cm tall and loosely tomentose; inflorescence 2-3 times branched and cyme-like, often with one small leaf-like bract and several small, often deciduous, scarious bracts at the base; rays of the inflorescence ascending; involucres tomentose, short-pedunculate, and ca. 4 mm long with triangular lobes; perianth yellow, not stipitate, ca. 1 mm long, sparsely villous; filaments and anthers yellow (based on specimens at MONTU).
3. **FIELD CHARACTERS:** Eriogonum lagopus is somewhat similar to and appears to intergrade with two other species found in south-central Montana: E. pauciflorum and E. mancum. The flowers of E. pauciflorum are white rather than yellow, and the inflorescence of E. mancum is head-like rather than umbrella-like.

## D. GEOGRAPHICAL DISTRIBUTION

1. **RANGE:** Eriogonum lagopus is known from Carbon County in south-central Montana. The type specimen is from near Custer in Yellowstone County, Montana (reported as Treasure County by Reveal 1967), and a second collection (Tweedy 1178 CAS) is from near Livingston in Park County, Montana (J. Reveal, personal



communication; Appendix A). The plant is also known from Big Horn and Sheridan counties, Wyoming (Dorn 1988)

2. **RECENTLY VERIFIED SITES:** There are 41 documented locations for E. lagopus in the Pryor Mountain Desert area south and west of the Pryor Mountains in southern Carbon County, Montana (Figure 1). Most of these were recorded during a floristic study of this area in 1991 (Lesica and Achuff 1992). Lichvar et al. (1984) report that the plant is frequent on Bighorn Canyon National Recreation Area in Big Horn and Carbon counties, Montana and Big Horn County, Wyoming. Although these researchers did not map locations for the species, they undoubtedly collected a number of specimens that would vouch for populations in their study area. Exact locations of known populations are in Table 1.
3. **HISTORICAL SITES:** The Yellowstone County, Montana collection was made in 1890 and the population has not been relocated. The Park County, Montana collection was probably made in the early 1900's and has not been relocated.

#### E. HABITAT

1. **ASSOCIATED VEGETATION:** Eriogonum lagopus always occurs on sparsely vegetated sites. At the north end of the Bighorn Basin in Montana, it can be found in many different plant associations. It is most common in cushion plant grasslands dominated by Ceratoides lanatus, Gutierrezia sarothrae, Chrysothamnus nauseosus, Agropyron spicatum and Phlox spp. It can also be found in desert shrub communities including Artemisia arbuscula-Agropyron spicatum, Artemisia tridentata-Agropyron spicatum, and Atriplex confertifolia-Chrysothamnus nauseosus types. Occasional populations occur in open Utah juniper woodlands (Juniperus osteosperma/Agropyron spicatum). Other common associates include Arenaria hookeri, Astragalus adsurgens, A. spatulatus, Cryptantha cana, Hymenoxys acaulis, Machaeranthera grindelioides and Senecio canus.
2. **TOPOGRAPHY:** Eriogonum lagopus is most often found on moderate to steep slopes; however, it is also common on wind-swept ridge tops.

Known sites in Carbon County, Montana range in elevation from 4,200 to 6,500 feet. Most sites are below 5,000 feet.

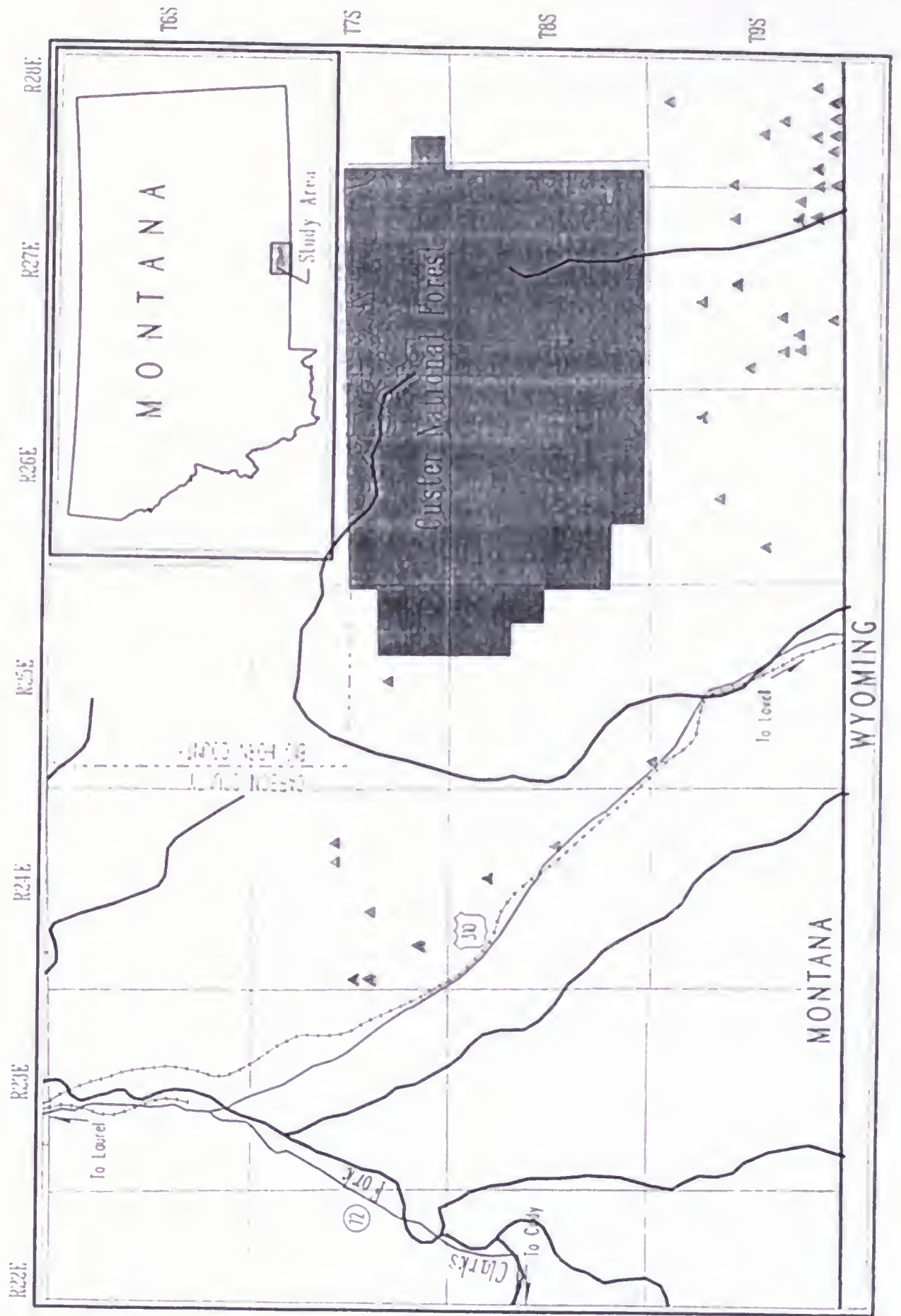


Figure 1. Location of *Eriogonum lagopus* populations in southern Carbon County.

Table 1. Location and size of Eriogonum lagopus populations with associated substrate, vegetation and elevation.

T9S R28E S33 SW	100-1000	Chugwater	Junost/Chrnau	4,150
T9S R28E S32 SE	100-1000	limestone	Gutsar/Agrspi	4,150
T9S R27E S25 SE	100-1000	Chugwater	Chrnau/Phlmus	4,400
T9S R28E S31 SW	100-1000	Chugwater	Chrnau/Phlmus	4,400
T7S R25E S27 NW	100-1000	limestone	Artarb/Agrspi	5,000
T9S R27E S28 NW	>1000	Chugwater	Cerlan/Agrspi	4,800
T9S R27E S15 SW	100-1000	calc shale	Artarb/Agrspi	5,050
T9S R27E S15 SW	<100	limestone	Agrspi/Phlmus	4,900
T9S R26E S12 SW	>1000	calc sandstone	Artarb/Agrspi	5,400
T9S R26E S12 SW	>1000	limestone	Agrspi/Phlmus	5,400
T9S R27E S19 NE	>1000	Chugwater	Junost/Agrspi	5,150
T9S R25E S06 NE	100-1000	silty	Arttri/Agrspi	4,450
T8S R24E S23 NW	>1000	shale	Gutsar/Agrspi	4,400
T8S R24E S10 NW	>1000	sandy clay	Chrnau/Agrspi	4,700
T8S R24E S10 NW	100-1000	silty (stony)	Arttri/Agrspi	4,700
T7S R24E S19 NW	>1000	sandy clay	Chrnau/Monnut	4,100
T7S R24E S19 NW	100-1000	sandstone	Pinlle/Artarb	4,250
T7S R24E S19 SW	>1000	sandy clay	Yucgla/Agrspi	4,100
T7S R24E S32 NW	>1000	clay	Chrnau/Atrdio	4,200
T7S R24E S32 NW	>1000	sandy clay	Chrnau/Agrspi	4,200
T7S R24E S21 SW	>1000	Chugwater	Chrnau/Agrspi	4,550
T7S R24E S15 SE	>1000	sandy clay	Chrnau/Agrdas	4,750
T7S R24E S14 SW	>1000	sandy clay	Arttri/Agrspi	4,800
T9S R27E S25 SW	100-1000	Chugwater	Arttri/Sticom	4,350
T9S R27E S13 SW	>1000	calc sandstone	Cerlan/Agrspi	5,200
T9S R27E S36 NW	100-1000	calc sandstone	Cerlan	4,400
T9S R27E S36 NW	100-1000	Chugwater	Junost/Chrnau	4,400
T9S R28E S34 NW	<100	Chugwater	Junost/Artarb	4,500
T9S R28E S28 NW	>1000	limestone	Cerlan/Agrspi	4,900
T9S R28E S04 SE	>1000	limestone	Gutsar/Agrspi	6,500
T9S R28E S18 SW	100-1000	calc sandstone	Junost/Agrspi	5,200
T9S R28E S20 SE	100-1000	calc sandstone	Junost/Cerled	4,500
T9S R28E S32 SW	>1000	calc sandstone	Cerlan/Agrspi	4,200
T9S R28E S31 NW	>1000	Chugwater	Yucgla/Oryhym	4,200
T9S R28E S31 NE	>1000	Chugwater	Junost/Erilag	4,200
T9S R28E S31 NE	100-1000	Chugwater	Gutsar/Oryhym	4,350
T9S R27E S33 SW	100-1000	Chugwater	Atrcon/Gutsar	4,700
T9S R27E S29 SW	100-1000	Chugwater	Phlmus/Agrspi	4,800
T9S R27E S29 NW	100-1000	Chugwater	Junost/Gutsar	4,850
T9S R27E S29 SE	100-1000	limestone	Phlmus/Agrspi	4,800
T9S R27E S29 SE	>1000	Chugwater	Phlmus/Agrspi	4,800



3. **SOIL RELATIONSHIPS:** Eriogonum lagopus is common on sandy clay soils derived from sandstone and shale and on sandy soil derived from Chugwater sandstone. It also occurs on sandy soil derived from limestone and calcareous sandstone. It occurs most often in shallow or eroding soils. Most of these soils probably have an alkaline reaction and many are probably saline.
4. **REGIONAL CLIMATE:** The climate of southern Carbon County is semi-arid. Bridger, Montana, just north and west of the Pryor Mountain Desert, receives an average of 12.7 inches annual precipitation, and mean daily temperatures for January and July are 21.5°F and 70.5°F, respectively (NOAA 1982). Lovell, Wyoming, on the east side of the Pryor Mountain Desert, receives an average of 7.1 inches precipitation annually. Daily temperatures averaged 16.8°F in January and 71.8°F in July (Knight et al. 1987). Spring and early summer rainfall accounts for two-thirds of the annual precipitation, the balance coming as snow (Knight et al. 1987).

#### F. POPULATION DEMOGRAPHY AND BIOLOGY

1. **PHENOLOGY:** In southern Carbon County, Eriogonum lagopus flowers from mid-June through mid-July. In 1991, a very late year, flowering did not really begin until early July and probably continued through late July.
2. **POPULATION SIZE AND CONDITION:** In southern Carbon County most populations of Eriogonum lagopus consist of more than 1000 plants and occupy several to hundreds of acres. Due to the extensive size of most populations, we did not attempt to estimate total population sizes. Estimates for E. lagopus density in 1.2-acre plots in many of the populations are given in Table 1.
3. **REPRODUCTIVE BIOLOGY**
  - a. **TYPE OF REPRODUCTION:** Production of seed is the only known method of reproduction in Eriogonum lagopus.
  - b. **POLLINATION BIOLOGY:** The pollinator(s) of Eriogonum lagopus in southern Carbon County are not known. The umbellate inflorescence and small size of individual flowers suggest that E. lagopus may be serviced by generalized pollinators, such as flies and beetles, that crawl over the surface of the inflorescence as in members of the Apiaceae (Faegri and van der Pijl 1971). It is also quite possible that

Eriogonum lagopus is capable of self-pollination and produces a proportion of its seed by selfing.

- c. **SEED DISPERSAL AND BIOLOGY:** The fruit of Eriogonum lagopus is a small hard achene. These achenes may be dispersed by seed-gathering insects such as ants. In some cases, the dried perianth may remain around the achene and act as wings, similar to the fruits of some species of Rumex. In this case, the seeds would be dispersed by wind (van der Pijl 1982).
- d. **SEEDLING BIOLOGY:** Eriogonum lagopus occurs in a very arid region. Recruitment may be limited to years with prolonged periods of above-average precipitation. Few seedlings were observed in 1991.

## G. ECOLOGY

### 1. BIOLOGICAL INTERACTIONS:

- a. **COMPETITION:** Eriogonum lagopus occurs only in sparse vegetation in very arid environments. Although plants in these sites are widely spaced, competition for water may be intense. It is unlikely that competition for nutrients or light is important.

Halogeton glomeratus is an exotic annual that has become common at the north end of the Bighorn Basin. Halogeton glomeratus increases the salinity of the soil which favors its own seedlings (Sauer 1988). It is possible that as this invasive species becomes more common in arid communities, it could limit recruitment of native perennials in much the same way that Bromus tectorum competes with native vegetation in the steppes west of the Continental Divide (Mack 1981).

- b. **HERBIVORY:** We observed no evidence of herbivory from insects, wildlife or livestock.
- ### 2. HYBRIDIZATION:
- Hybridization among the perennial species of Eriogonum is common (Welsh et al. 1987). Two closely related species of Eriogonum co-occur with E. lagopus in southern Carbon County: E. pauciflorum and E. mancum. E. pauciflorum is one of the putative parent species of E. lagopus, and backcrossing is not unexpected. We also observed plants that appeared intermediate

between E. lagopus and E. mancum. In the vast majority of cases, populations of E. lagopus did not show evidence of introgression with other species, even where two species occurred on the same site.

## II. LAND OWNERSHIP

1. **BUREAU OF LAND MANAGEMENT:** In southern Carbon County, Montana the majority of appropriate habitat and documented populations of Eriogonum lagopus are on land administered by the Bureau of Land Management.
2. **U. S. NATIONAL PARK SERVICE:** Eriogonum lagopus is reported to be frequent in Bighorn Canyon National Recreation Area (Lichvar et al. 1984). These populations have not been mapped.
3. **STATE OF MONTANA:** One population of E. lagopus was located on state land (T9S R27E S36 NW1/4) during our 1991 survey (Lesica and Achuff 1992). There are undoubtedly other populations on state land in the Pryor Mountain Desert area.
4. **CROW INDIAN RESERVATION:** It is likely that there are populations of E. lagopus on the east side of the Bighorn River on the Crow Reservation. There may also be populations on the west side of the river north of Bighorn Canyon N.R.A. Biological surveys have not been undertaken on the Crow Reservation because of tribal policy.
5. **PRIVATE:** Populations of E. lagopus occur on deeded land at the head of Bridger Creek (T7S R24E S19,20; T6S R24E S15). Other populations probably occur on the Tillett Ranch (T9S R27E S23,26,35).

## II. ASSESSMENT AND MANAGEMENT RECOMMENDATIONS

- A. **THREATS TO KNOWN POPULATIONS:** In southern Carbon County, Montana populations of Eriogonum lagopus may be threatened by (1) exotic weed encroachment, (2) mining and oil and gas development, (3) off-road vehicle use, and (4) livestock grazing.
  1. **EXOTIC WEED ENCROACHMENT:** Halogeton glomeratus is an Asian species that was introduced into arid western North America in 1934. It has since spread throughout much of the arid and semi-arid lands in the western U.S. It is poisonous to livestock and it

outcompetes many native species by increasing the salinity of the soil (Sauer 1988). This plant has become common in the Pryor Mountain Desert region and may be able to displace native plants including E. lagopus. However, at the present time there is no evidence that this is happening. Furthermore, E. lagopus is very common and only a monumental increase in H. glomeratus could threaten its persistence.

2. **MINING AND OIL AND GAS DEVELOPMENT:** Bentonite claims have been made on public lands east of Warren. Although E. lagopus does not generally occur on bentonite, it does occur in close proximity. Strip mining and associated road-building could damage nearby populations of E. lagopus.

Oil and gas development has occurred in Wyoming four miles south of Warren. Future developments could threaten populations of E. lagopus.

Bentonite mining and oil and gas development are localized in the Pryor Mountain Desert area, while populations of Eriogonum lagopus are widespread. It is unlikely that future developments could endanger a significant portion of these populations.

3. **OFF-ROAD VEHICLES:** At the present time there is relatively little off-road vehicle use in the Pryor Mountain Desert area. However, the topography and sparseness of the vegetation is appropriate for this sort of recreation. If off-road vehicle use increases substantially, it could damage some populations of E. lagopus. Since E. lagopus is so common in the area, damage would have to be very extensive before a significant proportion of the populations would be threatened.
4. **LIVESTOCK GRAZING:** Most of the Pryor Mountain Desert area is subject to cattle grazing. Our observations suggest that most of the area is far from water developments and grazing pressure is light enough that marginally palatable forbs like Eriogonum lagopus are not used to any great extent. Only populations near water developments are threatened by livestock grazing.

- B. **MANAGEMENT PRACTICES AND RESPONSE:** We are not aware of any information on the response of E. lagopus or any other perennial Eriogonums to livestock grazing. It is likely to be less palatable than perennial grasses and would probably increase under moderate grazing



pressure. Since this species occurs most often in barren soil, it may respond positively to moderate levels of disturbance.

C. **RECOMMENDATIONS FOR MAINTAINING VIABLE POPULATIONS:**

Eriogonum lagopus is common and widespread at the north end of the Bighorn Basin in Carbon County (and probably Bighorn County), Montana and Bighorn and Sheridan counties, Wyoming. It is unlikely that any reasonable management or recreational activities could threaten the persistence of this species in southern Carbon County.

D. **SUMMARY:** Eriogonum X lagopus is endemic to the northern Bighorn Basin of Carbon and Bighorn (?) counties, Montana and Bighorn and Sheridan counties, Wyoming. There are also two old collections from Park and Yellowstone counties, Montana. There is a good deal of taxonomic confusion regarding the correct name for this taxon. Eriogonum lagopus is common within its limited range, occurring in a number of different widespread plant communities. Most Montana populations are on land administered by the Bureau of Land Management and the U.S. Park Service. The species is currently listed as C-2 by the U.S. Fish and Wildlife Service under the 1973 Federal Endangered Species Act. It is also listed as a Species of Special Status, Priority 1 by the Montana Bureau of Land Management.

Eriogonum lagopus is common in its limited geographic range at the north end of the Bighorn Basin. There are no apparent threats to the long-term persistence of E. lagopus in the area. No special management activities are recommended at this time.

### III. LITERATURE CITED

- Dorn, R. D. 1977. Manual of vascular plants of Wyoming. Garland Publishing, New York.
- Dorn, R. D. 1988. Vascular plants of Wyoming. Mountain West Publishing, Cheyenne, Wyoming.
- Faegri, K. and L. van der Pijl. 1971. The principles of pollination ecology. Pergamon Press, Oxford.
- Hitchcock, C. L., A. Cronquist, M. Ownbey and J. W. Thompson. 1964. Vascular Plants of the Pacific Northwest. Part 2: Salicaceae to Saxifragaceae. University of Washington Press, Seattle.
- Knight, D. H., G. P. Jones, Y. Akashi, R. W. Myers. 1987. Vegetation ecology in the Bighorn Canyon National Recreation Area. Unpublished report submitted to Bighorn Canyon National Recreation Area, Fort Smith, Montana.
- Lesica, P. and J. S. Shelly. 1991. Sensitive, threatened and endangered vascular plants of Montana. Montana Natural Heritage Program, Occasional Publication No. 1, Helena, Montana.
- Lesica, P. and P.L. Achuff. 1992. Distribution of vascular plant species of special concern and limited distribution in the Pryor Mountain Desert, Carbon County, Montana. Montana Natural Heritage Program report to the Bureau of Land Management, Billings, Montana.
- Lichvar, R. W., E. I. Collins and D. H. Knight. 1984. Checklist of vascular plants for the Bighorn Canyon National Recreational Area. Report prepared for University of Wyoming - National Park Service Research Center, Laramie.
- Mack, R. N. 1981. Invasion of Bromus tectorum L. into western North America: an ecological chronicle. *Agroecosystems* 7: 145-165.
- National Oceanic and Atmospheric Association. 1982. Monthly normals of temperature, precipitation and heating and cooling degree days. Montana, 1951-1980. National Climate Center, Ashville, North Carolina.
- Reveal, J. L. 1967. Notes on Eriogonum - III: On the status of Eriogonum pauciflorum Pursh. *Great Basin Naturalist* 27: 102-117.
- Rydberg, P. A. 1917. Flora of the Rocky Mountains and adjacent plains. New York Botanical Garden, Bronx, New York.

- Sauer, J.D. 1988. Plant migration. University of California Press, Berkeley.
- Stokes, S. G. 1936. The genus Eriogonum. J. H. Neblett Press, San Francisco.
- USDI Fish and Wildlife Service. 1990. Endangered and threatened wildlife and plants; review of plant taxa for listing as endangered or threatened species; notice of review. Federal Register 55: 6184-6229.
- van der Pijl, L. 1982. Principles of dispersal in higher plants. Springer-Verlag, Berlin.
- Welsh, S. L., N. D. Atwood, L. C. Higgins and S. Goodrich. 1987. A Utah flora. Great Basin Naturalist Memoirs No. 9.

#### IV. APPENDIX: Communications from Robert Dorn and James Reveal



UNIVERSITY OF MARYLAND  
Division of Agricultural and Life Sciences  
College Park 20742

Department of Botany  
(301) 451-3812

1 October 1984

Mr. Peter Lesica  
Big Sky Field Office  
Power Block West  
Last Chance Gulch  
P.O. Box 258  
Helena, MT 59624

Dear Mr. Lesica:

I have not yet received your collections of Eriogonum lagopus which was to be sent by Dr. Kathy Peterson. Once it arrives, I shall be pleased to review it.

As to its range, the species is currently known only from near Livingston, Park Co., collected by Tweedy 1178 (Stanford University collection at California Academy of Sciences) and from Custer, Yellowstone Co. where it was gathered by Blankingship 113 (specimens at the University of California-Berkeley; Missouri Botanical Garden; and the Smithsonian Institution). The latter collection is the type of E. multiceps subsp. canum. The plant is also known in Big Horn and Sheridan counties in Wyoming. You report the plant from Carbon and Treasure counties in Montana, but have yet to see specimens supporting this distribution unless the locations of Livingston and Custer are misplaced as to county.

Hope this helps. I trust the specimen will be sent shortly.

Sincerely

James L. Reveal  
Professor

cc: K.M. Peterson



UNIVERSITY OF MARYLAND  
Division of Agricultural and Life Sciences  
College Park 20742

Department of Botany  
(301) 454-3812

18 November 1985

Mr. Peter Lesica  
Department of Botany  
University of Montana  
Missoula, MT 59812

Dear Mr. Lesica:

Thank you for the shipment of Eriogonum specimens. You have identified the majority correctly. They are as follows:

- |      |                                                                                                                             |
|------|-----------------------------------------------------------------------------------------------------------------------------|
| 3010 | <u>E. x lagopus</u> Rydb.                                                                                                   |
| 3327 | <u>E. mancum</u> Rydb.                                                                                                      |
| 3350 | <u>E. flavum</u> Nutt. in Fras. var. <u>piperi</u> (Greene) M.E.<br>Jones                                                   |
| 3379 | <u>E. ovalifolium</u> Nutt. var. <u>ovalifolium</u>                                                                         |
| 3452 | <u>E. x lagopus</u> Rydb.                                                                                                   |
| 3476 | <u>E. strictum</u> Benth. subsp. <u>proliferum</u> (Torr. & Gray) S.<br>Stokes var. <u>proliferum</u> (Torr. & Gray) Reveal |
| 3485 | <u>E. androsaceum</u> Benth. in DC.                                                                                         |
| 3548 | <u>E. ovalifolium</u> Nutt. var. <u>nevadense</u> Gandoger                                                                  |
| 3558 | <u>E. flavum</u> Nutt. var. <u>polyphyllum</u> (Small ex Rydb.) M.E.<br>Jones                                               |

As to Eriogonum ovalifolium and E. strictum: the two species frequently occur in the same general area and it is true that the two are, at best, only weakly differentiated on morphological grounds. In fact, in central Idaho, I have an as yet unnamed variety of E. ovalifolium in which the inflorescence is branched albeit in a fashion unlike that of E. strictum.

As to Eriogonum lagopus, this is a different matter. In the briefest of terms, and simplest of explanations, E. lagopus is a hybrid complex involving E. brevicaule and E. pauciflorum. Your 3452 is the most common expression that is found, a straight hybrid between the two or at most backcrossed onto E. brevicaule. Your 3010 is a new expression in this mess, and one I have not seen previously. This appears to be a backcross onto E. pauciflorum, and specifically a local expression of E. pauciflorum with few tepal hairs.

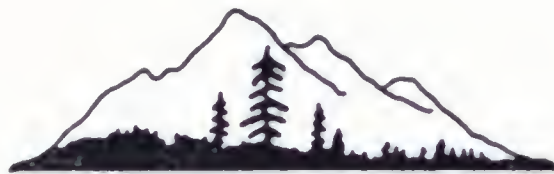
Thanks for the specimens. Please give Kathy Petterson my best.

Sincerely,

James L. Reveal

James L. Reveal  
Professor





## MOUNTAIN WEST ENVIRONMENTAL SERVICES

P.O. BOX 1471

CHEYENNE, WYOMING 82003

(307) 634-6328

January 14, 1992

Peter Lesica  
Box 8944  
Missoula, MT 59807

Dear Peter,

The problem involving Eriogonum lagopus is rather complex. Let me start with E. multiceps ssp. canum whose type came from Custer. The type is the same as all the material southward along the west slope of the ~~Big Horns~~ Big Horns at least as far as Lovell and west to the Bridger and Fromberg areas. The perianth is normally pubescent externally although some populations have a few plants with glabrous perianths, especially around Horseshoe Bend north of Lovell. The following names are based on the same type: E. brevicaule ssp. canum, E. brevicaule var. canum, and E. pauciflorum var. canum. The only difference I can find between these plants and E. brevicaule ssp. orendense var. micranthum is the pubescent perianth. When the perianth is glabrous, there is no difference except geography.

The type of E. lagopus came from Dayton on the east slope of the Big Horns. The type population has never been relocated. Furthermore, no other populations in the group have been found on the east slope of the Big Horns. What then is E. lagopus? Is it the same as E. brevicaule var. canum or is it different? The type is in very poor shape. It was collected in September which would be quite late for var. canum to be flowering. Rydberg said that the perianth was glabrous, yet if I remember correctly, it was in fact pubescent when I examined it (or perhaps some flowers were glabrous and some pubescent). Since we cannot find any additional material on the east slope, we have only the type to compare to, which is not adequate to resolve the problem.

I cannot consider var. canum on the west slope as any kind of hybrid because of its relatively broad range and relatively constant morphology. And I cannot agree with Reveal that it belongs with E. pauciflorum which has a whitish perianth and flowers in heads.

I have decided to consider E. lagopus the same as E. brevicaule var. canum rather than consider it as something different. If var. canum is placed under E. brevicaule, then E. lagopus must go there too whether it has glabrous or pubescent perianths because there are known differences from the overall morphology of E. brevicaule.

As for the nomenclature, one rule must be kept in mind: a name has no priority outside its own rank. Eriogonum lagopus was described as a species and was never transferred to subspecies or varietal status as far as I know, nor were any varieties or subspecies described under it. Therefore, it has no priority outside the rank of species. This means that the epithet lagopus can never have priority over canum at the varietal or subspecies rank.



If one considers the west slope plants to be the same as the type of E. lagopus from the east slope, and different from other taxa in Eriogonum, then the following names must be used:

at the species level - <u>E. lagopus</u> ,	} (under whatever species they are thought to belong, <u>E. brevicaule</u> in my case)
at the subspecies level - <u>ssp. canum</u> ,	
at the varietal level - <u>var. canum</u> .	

If Reveal thinks they are distinct at the species level, then E. lagopus is the correct name. I happen to think they are only varietally distinct so E. brevicaule var. canum is the correct name.

This may not resolve the problem, but I hope it clarifies it for you. If you have other questions, let me know.

Sincerely,



Robert D. Dorn

V. PHOTOGRAPH





